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Asteroids (star-fish) and Crinoids, which will, if we mistake not, be found of much use to palæontologists. Especial attention is devoted to certain organs called *Spherides*, grouped around the mouth of sea-urchins, for the discovery of which naturalists are indebted to Professor Lovén.

But to our mind the most interesting portion of the work is the exquisite drawings illustrating the anatomy and distribution of the nervous system and the water system of vessels. We have here for the first time, clearly shown, the more intimate relations of these organs.

The plates are abundant and beautifully executed, the lithographs rivaling in clearness and delicacy the best steel engravings.

MACALISTER'S ANIMAL MORPHOLOGY.[1] — Though this book was written in 1873, it is still the most recent manual of animal morphology in the English language, and will be found by advanced teachers to be very useful. The system of classification is that of Haeckel as modified by Huxley, and is based on recent embryological studies. The sponges are regarded as belonging to a distinct subkingdom, *Polystomata* of Huxley. The *Labyrinthuleæ* of Cienkowsky are admitted as a class of Protozoa. The Mollusca are regarded by the author, and we think correctly, as "only an extreme of specialization" of Vermes; in another place (page 241), "Their structure can be easily understood by regarding them as Vermes with no articulated appendages, modified by unequal lateral development, and by a fusion of metameres." For convenience they are regarded as a subkingdom. The Tunicates are placed among the Vermes in accordance with Gegenbaur's classification. The Polyzoa are placed among the Vermes, while rather inconsistently (probably because Gegenbaur first did so) the Brachiopoda are retained among the Mollusca. The volume ends with the Insects; a second volume, containing the Vertebrates, has just been issued from the press. Had we space to be critical we should feel inclined to find some fault with the author's classification of the Arthropoda, which he does not, however, claim to be original.

RECENT BOOKS AND PAMPHLETS. — Report on the Transportation Route along the Wisconsin and Fox Rivers, in the State of Wisconsin, between the Mississippi River and Lake Michigan. By Gen. G. K. Warren. Washington. 1876. 8vo, pp. 114. With Ten Maps.

The Grotto Geyser of the Yellowstone National Park. With a Descriptive Note and Map, and an Illustration by the Albert-type Process. (U. S. Geological and Geographical Survey of the Territories, F. V. Hayden, U. S. Geologist-in-Charge.) Washington, D. C. Folio.

The History of Spontaneous Generation. By Edward S. Dunster, M. D. (From Transactions of the Ann Arbor Scientific Association. Vol. i. 1871.) Ann Arbor. 8vo, pp. 30.

Über Dimorphismus und Variation einiger Schmetterlinge Nord Amerikas. Briefliche Mittheilung von J. Boll in Texas. 1876. 4to, pp. 3.

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[1] *An Introduction to Animal Morphology and Systematic Zoölogy.* By ALEXANDER MACALISTER, Professor of Comparative Anatomy and Zoölogy, University of Dublin. Part I. Invertebrata. London: Longmans, Green, & Co. 1876. 12mo, pp. 461. With a few Cuts.

New England Society of Orange, N. J. Scenery. I. October, 1876. 4to.

Mesozoic Fossils. Vol i. Part I. On some Invertebrates from the Coal-Bearing Rocks of the Queen Charlotte Islands, collected by Mr. James Richardson in 1872. By J. F. Whiteaves. Geological Survey of Canada. Montreal, 1876. 8vo, pp. 92. Ten Plates and Map.

The Origin of Californian Land Shells. By J. G. Cooper, M. D. (From the Proceedings of the California Academy of Sciences, February 1, 1875.) 8vo, pp. 3.

On Shells of the West Slope of North America. By J. G. Cooper, M. D. (From the Proceedings of the California Academy of Sciences, February 1, 1875.) 8vo, pp. 17.

New Facts relating to Californian Ornithology. No. 1. By J. G. Cooper, M. D. (From the Proceedings of the California Academy of Sciences, December 6, 1875.) 8vo, pp. 14.

On the Coal and Tertiary Strata of California. By J. G. Cooper, M. D. (From the Proceedings of the California Academy of Sciences, September 21, 1874.) 8vo, pp. 15.

Pacific Coast Lepidoptera. No. 15. Description of a new Species of Catocala, from San Diego. By Henry Edwards. (From the Proceedings of the California Academy of Sciences, October 18, 1875.) 8vo, pp. 1.

Pacific Coast Lepidoptera. No. 16. Notes on the Transformations of some Species of Lepidoptera, not hitherto recorded. By Henry Edwards. (From the Proceedings of the California Academy of Sciences, April 19, 1875.) 8vo, pp. 6.

Pacific Coast Lepidoptera. No. 17. On the Transformations of Colias (Meganostoma Reak) Eurydice Bdv. By Henry Edwards. (From the Proceedings of the California Academy of Sciences, June 5, 1876.) 8vo, pp. 2.

Darlingtonia Californica Torrey. By Henry Edwards. (From the Proceedings of the California Academy of Sciences, September 6, 1875.) 8vo, pp. 6.

Notice of Sir William Edmond Logan. By T. Sterry Hunt, LL. D. (From the Report of the American Academy of Arts and Sciences, May, 1876.) 8vo, pp. 6.

On the Affinities of Hypocephalus. By John L. Leconte, M. D. (Read before the National Academy of Sciences, October 10, 1876.) 8vo, pp. 10.

The Rocky Mountain Locust or Grasshopper. Being the Report of Proceedings of a Conference of the Governors of several Western States and Territories, together with several other Gentlemen, held at Omaha, Nebraska, on the 25th and 26th days of October, 1876, to consider the Locust Problem. 8vo, pp. 58.

Sopra Alcuni Opilioni (Phalangidea) d' Europa e dell' Asia Occidentale, con un quadro die Generi Europei, di Quest' Ordine. By Prof. T. Thorell. Genova. 1876. 8vo, pp. 57.

Enumerazione dei Rettili raccolti dal Dott. O. Beccari in Amboina, alle Isole Aru, ed alle Isole Kei, durante gli Anni 1872-73. By G. Doria. Genova. 1875. 8vo, pp. 33. Two Plates.

Elenco di una Collezione di Rettili raccolti a Bintenzorg (Giara) dal Signor G. B. Ferrari, ed inviati in dono al Museo Civico di Genova. By G. Doria. 8vo, pp. 6.

Diagnosi di Alcune nuove Specie di Coleotteri raccolte nella regione Austro-Malese dai Signori Dott. O. Beccari, L. M. d'Albertis, e A. A. Bruijn. By R. Gestro. 8vo, pp. 13.

Descrizione di una nuova Specie di Eupholus (Eupholus Bennettii n. sp.) By R. Gestro e L. M. d'Albertis. 8vo, pp. 3.

Note sopra Alcuni Carabici, appartenenti al Museo Civico di Genova, con Descrizioni di Specie nuove. By R. Gestro. 8vo, pp. 45. Illustrated.

Descrizione di un nuovo Genere e di Alcune nuove Specie di Coleotteri Papuani. By R. Gestro. 8vo, pp. 35.

Descrizione di Tre nuove Specie di Cicindelidi del l'Isola di Borneo. By R. Gestro. 8vo, pp. 4.

Descrizione di Tre Specie nuove del Genere Atractocerus appartenenti alle Collezioni Museo Civico di Genova. By R. Gestro. 8vo, pp. 4.

Osservazioni sopra Alcune Specie Italiane del Genere Cychrus. By R Gestro. 8vo, pp. 7.

Enumerazione dei Cetonidi, raccolti nell' Arcipelago Malese e nella Papuasia, dai Signori G. Doria, O. Beccari, e L. M. d'Albertis. By R. Gestro. 8vo, pp. 31. Appendix, pp. 28.

Note sopra Alcuni Coleotteri appartenenti alle Collezione del Museo Civico di Genova. By Dr. R. Gestro. 8vo, pp. 13.

Note sopra Alcuni Coleotteri appartenenti alle Collezione del Museo Civico di Genova. Nuova Specie del Genere Zanthe. By Dr. R. Gestro. 8vo, pp. 8.

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GENERAL NOTES.

BOTANY.[1]

FERTILIZATION OF GENTIANA ANDREWSII. — Humble-bees are in the habit of entering bodily into the flower of this gentian, forcing open the mouth of the corolla to do so where this is closed, as it is in the absence of sunshine, and the anthers open before the stigmas separate to expose the pollen-receiving surface; so it is evident that cross-fertilization is provided for. Our correspondent, Mr. M. W. Vandenberg, of Fort Edward, N. Y., communicates the result of some observations which show that this flower has likewise an arrangement for self-fertilization. The short tube of cohering and extrorsely opening anthers is higher than the stigma when the blossom first opens. The pistil afterwards lengthens, so that its apex protrudes; the broad and introrse stigmas now separate, at first moderately, but at length they diverge strongly and become revolute, so as to bring a portion of the broad stigmatic surface into contact with the outer face of the anther tube, which usually is still covered with abundance of pollen. The pollen appears to retain its freshness for a long time, and in this slow movement of revolution of the stigmas they are seen to take up considerable masses of the moist pollen. Those stigmas, therefore, which have failed to receive extraneous pollen from bees during the first day or two of anthesis, will afterwards secure it from their own anthers. "Get fertilized, cross-fertilized if you can, self-fertilized if you must, is nature's golden rule for flowers." — A. GRAY.

ORIGIN OF VARIETIES; TWO ILLUSTRATIONS. — Eight or ten years ago, on a plot of ground where I had grown beet seed of the early turnip variety, after the crop had been gathered from the seed that had dropped on the ground, there sprang up thousands of young plants. A large proportion of these lived through the winter. It is my impression that they had the protection of a thick growth of chick-weed. In the following spring, when plowing, these plants were so forward I left a portion of the piece unplowed, with the view of obtaining a

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[1] Conducted by PROF. G. L. GOODALE.